

General Notes

Table 2. Aquatic Macroinvertebrates of Wapanocca National Wildlife Refuge.

TURBELLARIA	<i>Gelastocoris oculatus</i> (Fabricius)	<i>Laccophilus maculosus</i> <i>maculosus</i> Say
✓ <i>Macrostomum appendiculatum?</i> (Fabricius)	<i>Gerris marginatus</i> Say	<i>Laccophilus proximus</i> <i>proximus</i> Say
✓ <i>Macrostomum tubum</i> (Graff)	<i>Limnoperus canaliculatus</i> (Say)	<i>Matus bicarinatus</i> (Say)
✓ <i>Catenula</i>	<i>Merragata brunnea</i> Drake	<i>Neobidessus pullus</i> <i>pullus</i> (LeConte)
✓ <i>Microdalyellia</i>	<i>Hydrometra</i>	<i>Thermonectes basilaris</i> (Harris)
✓ <i>Gyratrix hermaphroditus</i> Ehrenberg	<i>Mesovelia mulsanti</i> White	<i>Uvarus granarius</i> (Aube)
✓ <i>Mesostoma ehrenbergii</i> (Focke)	<i>Pelocoris femoratus</i> (Palisot de Beauvois)	<i>Uvarus lacustris</i> (Say)
✓ <i>Mesostoma lingua?</i> Schmidt	• <i>Ranatra australis</i> Hungerford	<i>Hydrocanthus iricolor atripennis</i> Say
✓ <i>Mesostoma verna?</i> Hyman	• <i>Ranatra Buenoi</i> Hungerford	<i>Suphisellus parsoni</i> Young
✓ <i>Phaenocora highlandense</i> Gilbert	<i>Ranatra nigra</i> Herrick-Shaffer	<i>Gyrinus analis</i> Say
✓ <i>Phaenocora lutheri?</i> Gilbert	<i>Notonecta irrorata</i> Uhler	<i>Peltodytes dunavani</i> Young
✓ <i>Rhynchosostoma rostrata</i> (Muller)	<i>Notonecta raleighi</i> Bueno	<i>Peltodytes sexmaculatus</i> Roberts
✓ <i>Typhloplana viridata</i> (Abildgaard) ?	<i>Notonecta undulata</i> Kirkaldy	<i>Cyphon</i>
OLIGOCHAETA	<i>Neoplea striola</i> (Fieber)	<i>Berosus pantherinus</i> LeConte
✓ <i>Aelosoma</i>	<i>Microvelia hinei</i> Drake	<i>Cercyon mendax</i> Smetana
✓ <i>Dero digitata</i> (Muller)	<i>Microvelia pulchella</i> Westwood	<i>Enochrus consortus</i> Green
✓ <i>Haemonais waldvogeli</i> Bretscher	EPHEMEROPTERA	<i>Enochrus ochraceus</i> (Melsh.)
✓ <i>Stylaria fossularis</i> Leidy	<i>Caenis</i>	<i>Helochares maculicollis</i> Mulsant
✓ <i>Aulodrilus pigueti</i> Kowalewski	<i>Calibaetis</i>	<i>Helocombus bifidus</i> LeConte
✓ <i>Limnodrilus hoffmeisteri</i> Claparede	ODONATA	<i>Helophorus</i>
✓ <i>Peloscolex multisetsosus</i> (Smith)	<i>Argia</i>	<i>Hydrochus rufipes</i> Melsh.
HIRUDINEA	<i>Anomalagrion hastatum</i> (Say)	<i>Hydrochus subcupreus</i> LeConte
✓ <i>Erpobdella punctata</i> (Leidy)	<i>Enallagma civile</i> (Hagen)	<i>Hydrophilus triangularis</i> Say
✓ <i>Mooreobdella microstoma</i> (Moore)	<i>Enallagma signatum</i> (Hagen)	<i>Paracymus subcupreus</i> (Say)
✓ <i>Helobdella stagnalis</i> (Linnaeus)	<i>Ischnura posita</i> (Hagen)	<i>Tropisternus blatchleyi</i> blatchleyi d'Orch.
✓ <i>Helobdella triserialis</i> (Blanchard)	<i>Gomphus maxwelli</i> Ferguson	<i>Tropisternus lateralis</i> <i>nimbatus</i> (Say)
✓ <i>Placobdella montifera</i> Moore	<i>Anax junius</i> Drury	<i>Tropisternus mexicanus</i> <i>mexicanus</i> LaPorte
✓ <i>Placobdella ornata</i> (Verrill)	<i>Epitheca cynosura</i> (Say)	<i>Tropisternus mexicanus</i> <i>striolatus</i> (LeConte)
GASTROPODA	<i>Erythemis simplicicollis</i> Say	DIPTERA
✓ <i>Goniobasis potosiensis plebeius</i> (Anthony)	<i>Libellula vibrans</i> Fabricius	<i>Atrichopogon</i>
✓ <i>Viviparus intertextus</i> (Say)	<i>Pachydiplax longipennis</i> Burmeister	<i>Chaoborus punctipennis</i> (Say)
✓ <i>Lymnaea (Pseudosuccinea) columella</i> (Say)	<i>Pantala flavescens</i> Fabricius	<i>Ablabesmyia peleensis</i> (Walley)
✓ <i>Gyraulus parvus</i> (Say)	<i>Perithemis tenera</i> Say	<i>Ablabesmyia</i>
✓ <i>Helisoma trivolvis</i> (Say)	<i>Plathemis lydia</i> Drury	<i>Clinotanypus pinguis</i> (Loew)
✓ <i>Menetus dilatatus</i> (Gould)	<i>Tramea lacerata</i> Hagen	<i>Chironomus crassicaudatus</i> Malloch
✓ <i>Physa gyrina?</i> Say	MEGALOPTERA	<i>Coelotanypus</i>
PELÉCYPODA	<i>Chauliodes rusticornis</i> Rambur	<i>Cricotopus remus</i> Sublette
✓ <i>Musculium lacustre</i> (Muller)	TRICHOPTERA	<i>Cricotopus</i>
✓ <i>Musculium transversum</i> (Say)	<i>Hydropsyche</i>	<i>Dicrotendipes nervosus</i> (Staeger)
✓ <i>Carunculina parva</i> (Barnes)	* <i>Potamya flava</i> (Hagen)	<i>Einfeldia</i>
ISOPODA	<i>Orthotrichia aegerfasciella</i> (Chambers)	<i>Endochironomus nigricans</i> (Johannsen)
* <i>Caecidotea laticaudata?</i> (Williams)	* <i>Oxyethira pallida</i> (Banks)	<i>Glyptotendipes lobiferus</i> (Say)
✓ <i>Caecidotea obtusa</i> (Williams)	<i>Agrypnia vestita</i> (Walker)	<i>Glyptotendipes</i>
✓ <i>Lirceus</i>	<i>Oecetis cinerascens</i> (Hagen)	<i>Goeldichironomus holoprasinus</i> (Goeldi)
AMPHIPODA	* <i>Oecetis distissa</i> Ross	<i>Hydrobaenus</i>
✓ <i>Hyalella azteca</i> (Sassure)	<i>Oecetis inconspicua</i> (Walker)	<i>Kiefferulus dux</i> (Johannsen)
✓ <i>Crangonyx sp. nr. gracilis</i> Smith	LEPIDOPTERA	<i>Larsia</i>
DECAPODA	<i>Ostrinia penitalis</i> Grote	<i>Lauterborniella</i>
✓ <i>Palaemonetes kadiakensis</i> Rathbun	COLEOPTERA	<i>Parachironomus</i>
✓ <i>Procambarus (Ortmannicus) acutus acutus</i> (Girard)	<i>Phytobius velatus</i> Beck	<i>Polydendrum illinoense</i> (Malloch)
COLLEMBOLA	<i>Agabus aeruginosus</i> Aube	<i>Polydendrum</i>
✓ <i>Isotomurus palustris</i> (Muller)	<i>Bidessonotus inconspicuous</i> (LeConte)	<i>Procladius</i>
✓ <i>Podura aquatica</i> Linnaeus	<i>Celina angustata</i> Aube	<i>Tanypus</i>
✓ <i>Sminthurides</i>	<i>Coptotomus venustus</i> Say	<i>Culex territans</i> Walker
HEMIPTERA	<i>Hydroporus hybridus</i> (Aube)	<i>Empididae</i>
✓ <i>Belostoma lutarium</i> (Stal)	<i>Hydroporus rufilabris</i> Sharp	<i>Sepedon</i>
✓ <i>Hesperocorixa lucida</i> (Abbott)	<i>Hydroporus undulatus</i> undulatus Say	<i>Odontomyia</i>
✓ <i>Hesperocorixa nitida</i> (Fieber)	<i>Hydrovatus pustulatus</i> compressus Sharp	<i>Stratiomys</i>
✓ <i>Trichocorixa calva</i> (Say)	<i>Hydrovatus pustulatus</i> pustulatus Melsh.	<i>Chrysops</i>
✓ <i>Trichocorixa kanza</i> Sailor	<i>Laccophilus fasciatus</i> rufus Melsh.	<i>Tipula</i>

*Denotes new state records

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Eight trips and 14 discrete collections were made between 8 March 1977 and 8 March 1980 (Table 1, Fig. 1). On most occasions, aquatic dip nets were used, and specimens were preserved in 70% EtOH. Adult odonates were collected with sweep nets, papered, placed in acetone overnight, then placed in clear plastic envelopes with data cards. A light trap was used on 1 October 1979, and all adult caddisfly and true fly data are from this collection. All specimens are catalogued and housed in the ASU aquatic macroinvertebrate collection.

One hundred sixty-three taxa were collected, of which 130 were identified to species or subspecies (Table 2). Greatest diversity was provided by Coleoptera (39 taxa), Diptera (31 taxa) and Hemiptera (21 taxa). The composition of the aquatic macroinvertebrate community reflects the refuge's shallow, thickly vegetated nature. Coleoptera and Hemiptera are, in general, poorly adapted to an aquatic existence, and do best in such habitats. The Diptera collected are characteristic of aquatic ecosystems having a rich organic substrate.

Six species known to be new state records are designated by an asterisk (Table 2). Five of these (*Ranatra australis*, *R. buenoi*, *Potamya flava*, *Oxyethyra pallida* and *Oecetis distissa*) are common, widespread, and their occurrence has been published for most contiguous states. The publication of such common species as new state records for Arkansas emphasizes our lack of knowledge regarding many Arkansas floral and faunal groups.

The sixth species, *Caecidotea laticaudata*, shows some differences from the original description (Williams, W. D. 1970. A revision of North American epigean species of *Asellus* (Crustacea: Isopoda). Smithsonian Contr. to Zool. 49:1-80), and approaches *C. foxi* (Flemming, L. E. 1972. The evolution of the eastern North American isopods of the genus *Asellus* (Crustacea: Asellidae). Part I. Int. J. Speleol. 4:221-256) in some respects, especially in the long cannula on the second pleopod endopod of the male. Either *C. laticaudata* is a variable species that includes *C. foxi* and the Wapanocca specimens, or the Wapanocca specimens represent an undescribed species (Thomas E. Bowman, Crustacea Curator, Natl. Museum of Natural History, pers. comm.).

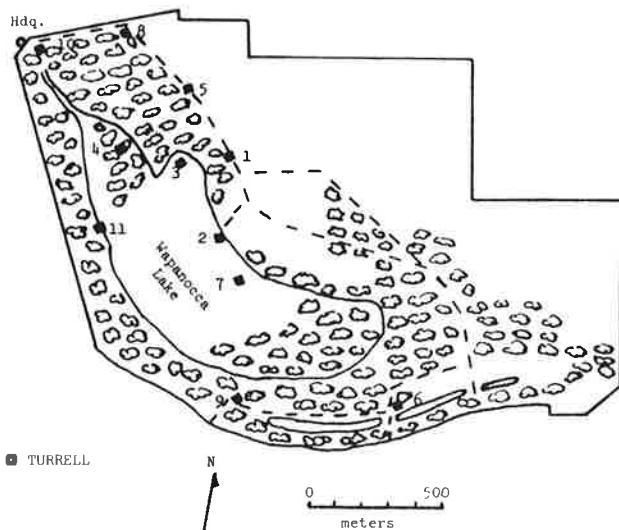


Figure 1. Wapanocca National Wildlife Refuge. Collecting Stations are designated by numbers 1-11.

Table 1. Collecting Stations and Dates, Wapanocca National Wildlife Refuge.

Station*	Description of Station with date
1	Borrow pit 600 m N of observation tower. 3 March 1977.
2	Observation tower. 3 March 1977, 28 July 1978, 1 October 1979.
3	North corner of Wapanocca Lake. 5 May 1977.
4	Boat trail. 5 May 1977.
5	Borrow pit 1500 m NNW of observation tower. 11 August 1977.
6	NW corner of Woody Pond 2. 11 August 1977.
7	Water lotus bed, Wapanocca Lake. 29 October 1977.
8	Borrow pit 1200 m E of headquarters building. 29 October 1977.
9	NW corner of Woody Pond 1. 28 July 1978.
10	Boat landing 100 m SE of headquarters building. 21 April 1979, 8 March 1980.
11	Public boat launching area. 8 March 1980.

*Station numbers correspond with those of Figure 1.

The diversity of aquatic macroinvertebrates in this refuge suggests three things. First, a variety of microhabitats is available. The borrow pits immediately adjacent and parallel to the levees consistently yielded the greatest diversity of macroinvertebrates. Swamp habitat also supported a diverse fauna. Diversity of aquatic plants was greatest in these areas, and water depth varied to a maximum of 2 m. Cypress stands supported fewer species, because fewer microhabitats are present in these nearly homogeneous stands. A second point regards food. The abundant decomposing vegetation in fairly shallow, fairly clear water allows rapid recycling of nutrients. This contributes greatly to the food base and supports a numerically dense macroinvertebrate community as well as a diverse one. Finally, the diversity and abundance of aquatic macroinvertebrates suggest that this refuge possesses water of good quality. Neither turbidity nor potential contaminants become limiting, it would appear. The diversity and density of molluscs also suggest that the water is at least moderately hard and therefore has some buffering capacity. Little information has been published concerning the water quality requirements of aquatic Hemiptera. Nevertheless, personal observations indicate that certain taxa (e.g. *Merragata*, *Pelocoris*, *Neoplea*) require undisturbed, clean habitat for population development. *Neoplea striola* requires static, shallow, clear water where there is an organic bottom and a high nutrient source with thin-stemmed or narrow-leaved vegetation (Gittleman, S. H. 1974. The habitat preference and immature stages of *Neoplea striola* (Hemiptera: Pleidae). J. Kansas Entomol. Soc. 47(4):491-503). In the present study *Pelocoris* was taken regularly, and one series of 73 specimens was collected in a short period of time. *Neoplea* was collected on every occasion, and once was captured at an estimated rate of 100 individuals per dip net sample.

We conclude that Wapanocca National Wildlife Refuge is successfully maintaining populations of species indigenous to Arkansas' bottomland hardwood forests. Such sanctuaries are an important counterbalance to man's continued alteration of his environment.

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